

SEQUENCE LISTING

<110> Paul D. Robbins
 Zhibao Mi
 Raymond Frizzell
 Joseph C. Glorioso
 Andrea Gambotto

<120> IDENTIFICATION OF PEPTIDES THAT FACILITATE
 UPTAKE AND CYTOPLASMIC AND/OR NUCLEAR TRANSPORT
 OF PROTEINS, DNA AND VIRUSES

<130> AP32573-A-A

<150> 60/151,980

<151> 1999-09-01

<150> 60/188,944

<151> 2000-03-13

<160> 75

<170> FastSEQ for Windows Version 3.0

<210> 1

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 1

Lys	Arg	Ile	Ile	Gln	Arg	Ile	Leu	Ser	Arg	Asn	Ser
1				5						10	

<210> 2

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 2

Lys	Arg	Ile	His	Pro	Arg	Leu	Thr	Arg	Ser	Ile	Arg
1				5						10	

<210> 3

<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 3
Pro Pro Arg Leu Arg Lys Arg Arg Gln Leu Asn Met
1 5 10

<210> 4
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 4
Pro Ile Arg Arg Arg Lys Lys Leu Arg Arg Leu Lys
1 5 10

<210> 5
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 5
Arg Arg Gln Arg Arg Thr Ser Lys Leu Met Lys Arg
1 5 10

<210> 6
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 6
Met His Lys Arg Pro Thr Thr Pro Ser Arg Lys Met
1 5 10

<210> 7
<211> 12
<212> PPT
<213> Artificial Sequence

<220>

<223> random peptide library

<400> 7

Arg Gln Arg Ser Arg Arg Arg Pro Leu Asn Ile Arg
1 5 10

<210> 8

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 8

Arg Ile Arg Met Ile Gln Asn Leu Ile Lys Lys Thr
1 5 10

<210> 9

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 9

Ser Arg Arg Lys Arg Gln Arg Ser Asn Met Arg Ile
1 5 10

<210> 10

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 10

Gln Arg Ile Arg Lys Ser Lys Ile Ser Arg Thr Leu
1 5 10

<210> 11

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 11
Pro Ser Lys Arg Leu Leu His Asn Asn Leu Arg Arg
1 5 10

<210> 12
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 12
His Arg His Ile Arg Arg Gln Ser Leu Ile Met Leu
1 5 10

<210> 13
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 13
Pro Gln Asn Arg Leu Gln Ile Arg Arg His Ser Lys
1 5 10

<210> 14
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 14
Pro Pro His Asn Arg Ile Gln Arg Arg Leu Asn Met
1 5 10

<210> 15
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 15
Ser Met Leu Lys Arg Asn His Ser Thr Ser Asn Arg
1 5 10

<210> 16
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 16
Gly Ser Arg His Pro Ser Leu Ile Ile Pro Arg Gln
1 5 10

<210> 17
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 17
Ser Pro Met Gln Lys Thr Met Asn Leu Pro Pro Met
1 5 10

<210> 18
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 18
Asn Lys Arg Ile Leu Ile Arg Ile Met Thr Arg Pro
1 5 10

<210> 19
<211> 16
<212> PPT
<213> antennepedia

<400> 19
Arg Gln Ile Lys Ile Trp Phe Gln Asn Arg Arg Met Lys Trp Lys Lys
1 5 10 15

<210> 20
<211> 12
<212> PPT
<213> Artificial Sequence

<220>

<223> random peptide library

<400> 20

Ala Arg Pro Leu Glu His Gly Ser Asp Lys Ala Thr
1 5 10

<210> 21

<211> 11

<212> PPT

<213> human

<400> 21

Tyr Gly Arg Lys Lys Arg Arg Gln Arg Arg Arg
1 5 10

<210> 22

<211> 7

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 22

Lys Leu Ala Lys Leu Ala Lys
1 5

<210> 23

<211> 14

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 23

Lys Leu Ala Lys Leu Ala Lys Lys Leu Ala Lys Leu Ala Lys
1 5 10

<210> 24

<211> 23

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 24

Arg Arg Gln Arg Arg Thr Ser Lys Leu Met Lys Arg Gly Gly Lys Leu
1 5 10 15
Ala Lys Leu Ala Lys Lys Leu Ala Lys Leu Ala Lys

20

25

<210> 25

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 25

His Gly Trp Glx Ile His Gly Leu Leu His Arg Ala

1

5

10

<210> 26

<211> 11

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 26

Ala Val Pro Ala Lys Lys Arg Glx Lys Ser Val

1

5

10

<210> 27

<211> 11

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 27

Pro Asn Thr Arg Val Arg Pro Asp Val Ser Phe

1

5

10

<210> 28

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 28

Leu Thr Arg Asn Tyr Glu Ala Trp Val Pro Thr Pro

1

5

10

<210> 29

<211> 13
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 29
Ser Ala Glu Thr Val Glu Ser Cys Leu Ala Lys Ser His
1 5 10

<210> 30
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 30
Tyr Ser His Ile Ala Thr Leu Pro Phe Thr Pro Thr
1 5 10

<210> 31
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 31
Ser Tyr Ile Gln Arg Thr Pro Ser Thr Thr Leu Pro
1 5 10

<210> 32
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 32
Ala Val Pro Ala Glu Asn Ala Leu Asn Asn Pro Phe
1 5 10

<210> 33
<211> 12
<212> PPT
<213> Artificial Sequence

<220>

<223> random peptide library

<400> 33

Ser Phe His Gln Phe Ala Arg Ala Thr Leu Ala Ser
1 5 10

<210> 34

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 34

Gln Ser Pro Thr Asp Phe Thr Phe Pro Asn Pro Leu
1 5 10

<210> 35

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 35

His Phe Ala Ala Trp Gly Gly Trp Ser Leu Val His
1 5 10

<210> 36

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 36

His Ile Gln Leu Ser Pro Phe Ser Gln Ser Trp Arg
1 5 10

<210> 37

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 37
Leu Thr Met Pro Ser Asp Leu Gln Pro Val Leu Trp
1 5 10

<210> 38
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 38
Phe Gln Pro Tyr Asp His Pro Ala Glu Val Ser Tyr
1 5 10

<210> 39
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 39
Phe Asp Pro Phe Trp Lys Tyr Ser Pro Arg Asp
1 5 10

<210> 40
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 40
Phe Ala Pro Trp Asp Thr Ala Ser Phe Met Leu Gly
1 5 10

<210> 41
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 41
Phe Thr Tyr Lys Asn Phe Phe Trp Leu Pro Glu Leu
1 5 10

<210> 42
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 42
Ser Ala Thr Gly Ala Pro Trp Lys Met Trp Val Arg
1 5 10

<210> 43
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 43
Ser Leu Gly Trp Met Leu Pro Phe Ser Pro Pro Phe
1 5 10

<210> 44
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 44
Ser His Ala Phe Thr Trp Pro Thr Tyr Leu Gln Leu
1 5 10

<210> 45
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 45
Ser His Asn Trp Leu Pro Leu Trp Pro Leu Arg Pro
1 5 10

<210> 46
<211> 12
<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 46

Ser Trp Leu Pro Tyr Pro Trp His Val Pro Ser Ser
1 5 10

<210> 47

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 47

Ser Trp Trp Thr Pro Trp His Val His Ser Glu Ser
1 5 10

<210> 48

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 48

Ser Trp Ala Gln His Leu Ser Leu Pro Pro Val Leu
1 5 10

<210> 49

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 49

Ser Ser Ser Ile Phe Pro Pro Trp Leu Ser Phe Phe
1 5 10

<210> 50

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 50

Leu Asn Val Pro Pro Ser Trp Phe Leu Ser Gln Arg
1 5 10

<210> 51

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 51

Leu Asp Ile Thr Pro Phe Leu Ser Leu Thr Leu Pro
1 5 10

<210> 52

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 52

Leu Pro His Pro Val Leu His Met Gly Pro Leu Arg
1 5 10

<210> 53

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 53

Val Ser Lys Gln Pro Tyr Tyr Met Trp Asn Gly Asn
1 5 10

<210> 54

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 54

Asn Tyr Thr Thr Tyr Lys Ser His Phe Gln Asp Arg
1 5 10

<210> 55
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 55

Ala Ile Pro Asn Asn Gln Leu Gly Phe Pro Phe Lys
1 5 10

<210> 56
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 56

Asn Ile Glu Asn Ser Thr Leu Ala Thr Pro Leu Ser
1 5 10

<210> 57
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 57

Tyr Pro Tyr Asp Ala Asn His Thr Arg Ser Pro Thr
1 5 10

<210> 58
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 58

Asp Pro Ala Thr Asn Pro Gly Pro His Phe Pro Arg
1 5 10

<210> 59
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 59
Thr Leu Pro Ser Pro Leu Ala Leu Leu Thr Val His
1 5 10

<210> 60
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 60
His Pro Gly Ser Pro Phe Pro Pro Glu His Arg Pro
1 5 10

<210> 61
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 61
Thr Ser His Thr Asp Ala Pro Pro Ala Arg Ser Pro
1 5 10

<210> 62
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 62
Met Thr Pro Ser Ser Leu Ser Thr Leu Pro Trp Pro
1 5 10

<210> 63
<211> 12
<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 63

Val Leu Gly Gln Ser Gly Tyr Leu Met Pro Met Arg
1 5 10

<210> 64

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 64

Gln Pro Ile Ile Ile Thr Ser Pro Tyr Leu Pro Ser
1 5 10

<210> 65

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 65

Thr Pro Lys Thr Met Thr Gln Thr Tyr Asp Phe Ser
1 5 10

<210> 66

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 66

Asn Ser Gly Thr Met Gln Ser Ala Ser Arg Ala Thr
1 5 10

<210> 67

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 67

Gln Ala Ala Ser Arg Val Glu Asn Tyr Met His Arg
1 5 10

<210> 68

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 68

His Gln His Lys Pro Pro Pro Leu Thr Asn Asn Trp
1 5 10

<210> 69

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 69

Ser Asn Pro Trp Asp Ser Leu Leu Ser Val Ser Thr
1 5 10

<210> 70

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 70

Lys Thr Ile Glu Ala His Pro Pro Tyr Tyr Ala Ser
1 5 10

<210> 71

<211> 12

<212> PPT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 71

Glu Pro Asp Asn Trp Ser Leu Asp Phe Pro Arg Arg
1 5 10

<210> 72
<211> 12
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 72

His Gln His Lys Pro Pro Pro Leu Thr Asn Asn Trp
1 5 10

<210> 73
<211> 19
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 73

Gly Val Val Gly Lys Leu Gly Gln Arg Arg Thr Lys Lys Gln Arg Arg
1 5 10 15
Gln Lys Lys

<210> 74
<211> 31
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 74

Gly Arg Arg Thr Lys Lys Gln Arg Arg Gln Lys Lys Pro Pro Arg Tyr
1 5 10 15
Met Ile Leu Gly Leu Leu Ala Leu Ala Ala Val Cys Ser Ala Ala
20 25 30

<210> 75
<211> 14
<212> PPT
<213> Artificial Sequence

<220>
<223> random peptide library

<400> 75

Gly Arg Arg Thr Lys Lys Gln Arg Arg Gln Lys Lys Pro Pro
1 5 10